REBUILD ATLANTA
ENERGY AUDITOR'S REPORT
ATLANTA CENTER FOR EMPLOYMENT & TRAINING

Prepared: August 9, 2004
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REPORT PREFACE

The information contained in this report consists of findings and recommendations conducted by the City of Atlanta's Energy Conservation Program through the Rebuild Atlanta initiative. The following information was gathered during a walk-through type audit designed to assess the general condition of the facility with an emphasis on discovering energy efficiency opportunities. All related observations and recommendations are based on the best available knowledge of the auditors and should not be considered conclusive, but rather an indication of building conditions. Any actions taken should be done so with the independent advice of experts. The Energy Conservation Program will be pleased to assist the Bureau of General Services in coordinating this technical assistance.

Building Summary

Atlanta Center for Employment & Training **818 Washington Ave.** **Atlanta, Georgia 30303**	
Year Built:	1978
Building Size:	~100,000 square feet (three stories)
Occupants:	Unknown
Operating Schedule:	8:00 a.m. – 5:00 p.m. with occasional evening functions
Electricity Cost (2003):	$72,462
Electricity Usage (2003):	993,000 kWh
Cost Per Square Foot:	$0.72/ft^2
Usage Per Square Foot:	9.93 kWh/ft^2
Natural Gas Cost (2002):	$20,016
Natural Gas Usage (2002):	30,697 CCF
Cost Per Square Foot:	$0.20/ft^2
Usage Per Square Foot:	0.30 CCF/ft^2

Recommendations

This section focuses on items that will be pursued by the Energy Conservation Program in cooperation with your department. Follow-up actions are outlined in more detail in Appendix A.

- Lighting
    - Complete lighting upgrades (replace incandescent bulbs with CFLs)
    - Replace exit signs with LED models
    - Install controls or establish operations procedures for indoor and garage lighting
- HVAC
    - Incorporate third floor into existing energy management system (EMS)
    - Performance test duct system; seal and reconnect ducts as necessary

Reported Items

This section contains items that were noted during the energy audit but do not fall under the scope of the Energy Conservation Program. Additional detail on these items is provided in Appendix B.

- HVAC
    - Install variable speed drives (VFD) on cooling tower, pumps and air-handling unit fans.
    - Third floor HVAC system may require re-commissioning following system expansion
- Envelope
    - Restore building envelope integrity (roof leaks)
    - Inspect firewall on first floor, east and west wings floor to determine integrity
- Water
    - Consider replacing indoor water fixtures with low-flow models when replacement is required.
    - Consider replacing irrigation system with high-efficiency drip system when replacement is required.

Narrative

Executive Summary

The Atlanta Center for Employment and Training, or ACET, appears to be a well operated and maintained building with relatively minor needs regarding energy efficiency. The building has had lighting and HVAC system retrofits and is currently under a building energy management system, or EMS. This EMS has the capacity to operate HVAC equipment within determined set points (i.e. nighttime set back) however, it is not understood how the system is being used. Lighting on-off times can also be controlled with this system but is not presently being utilized as additional wiring and control modifications will be required.

General Description and Observations

The ACET is an approximately 100,000 square foot building built in 1978. The building use, though modified over the years, has stayed relatively constant and has training rooms for various interdisciplinary vocations, office space, non-profit offices, a kitchen, multi-purpose room and automobile garage space. The hours of operation are generally 800am to 500pm. The auditorium, with 578 seats, is rented out for various functions and there are some evening functions at the center but not on a regular basis.

HVAC System

Air conditioning and heating to the ACET building is supplied by a central liquid chiller (160 ton capacity), cooling tower, boiler for hot water supply and rooftop mounted air-handling units (AHU). Chilled water and heating water pumps distribute water from the chiller and boiler to the air-handling unit coils through a piping system. The chiller and the cooling tower were replaced in 1999.

Three main air-handling units serve the building. The multi-purpose room and auditorium are served by constant volume AHU's and the rest of the building is under a variable air volume (VAV) system which is supplied by a third AHU with a 100 HP supply fan motor.

The building has been modified with a direct digital control (DDC) system for control of the HVAC system. The third floor space, however, has not undergone retrofits of any kind and is not under the control of the DDC system.

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Lighting System

The ACET had a lighting retrofit in 1999 but the scope was not throughout the entire building and there is still opportunity for lighting system economy to be made. For instance, incandescent lights are still in use in this facility. Also, lighting system shutdown is left to the cleaning crews and, historically, this has not been a reliable form of lighting shutdown.

Additionally, it was noted in several areas of the building that the use of day lighting is a possibility. "Daylighting" is the use of outside light to illuminate a space and results in

significant lighting and HVAC savings. Some of the space can utilize daylight for extended periods without introducing building modification or control upgrades. Simple human control could result in great savings.

Of additional concern was the lighting system in place in the garage area. It was noted in the initial interview that this space has significant lighting that remains on for extended periods even when lighting is not needed. Therefore, it is suggested that the facilities staff gather information that enables them to assess the garage schedule, identify the types of lighting used in the space and the control system currently in place. In this case, it also appears mandatory that the current "culture" within this space be analyzed to determine if there are any operational measures that can be employed to reduce lighting "on" time.

Domestic Water System

The domestic water system appears to be typical for this type of building with water supplies to rest rooms, drinking fountains, the kitchen, and boiler make-up supply. It is expected that water consumption could be reduced by installing low, or no, flow fixtures into the spaces when it is time for replacement.

The building has a minimal irrigation system installed that serves the front flower bed. Again, upon time of replacement, the City can consider the use of high efficiency drip irrigation systems.

Envelope

Staff reported the continuing problem of roof leaks at various points into the space. The roof of this structure is a "built-up" roof consisting of an insulating material above a metal deck covered with a waterproof membrane and stone. Standing water was noted at various points on the roof surface.

The integrity of the vertical surfaces of the envelope (i.e. walls and windows) was in question, as it appears the concrete structure may have some settling issues and also issues with various penetrations throughout the areas. The building is of sturdy design and incorporates good overhangs for shading.

Goals

The goals for this building center on completing and optimizing upgrades that have already been started including lighting and HVAC.

In accordance with the City of Atlanta's Lighting Retrofit Guidelines, the lighting upgrades should be completed in this facility with the aim of eliminating the use of incandescent lamps where they are not necessary, including downlights, exit signs and other fixtures.

The building is currently under the scope of an energy savings performance contract that has replaced HVAC equipment and controls throughout much of the building. Since the City of

Atlanta now occupies the entire building, areas not included in the original retrofit should be brought under control of the existing system. The entire HVAC system may need to be tuned and optimized following this project.

Conclusion

The ACET is operating at a reasonable level of efficiency for building of this age and era. Significant energy savings are possible by incorporating the features mentioned above. Should the City elect to pursue the improvements discussed, Southface recommends that the services of a Professional Engineer and commissioning agent be employed to design and check the system improvements to ensure that performance requirements are met. Care must be taken to ensure that any future upgrades are integrated with existing building systems and that all upgrades are optimized in accordance with the building's current uses.

Appendix A: Recommended Actions (Follow-up Actions Planned)

Lighting

Schedule lighting retrofit for all T12 fixtures, downlamps and LED Exit Signs as recommended by the *City of Atlanta Lighting Retrofit Guidelines*. Eliminate incandescent fixtures as much as possible.

HVAC

Work with HVAC contractor to institute an HVAC controls system that enables temperature setback during unoccupied periods. See *General Services, Building Controls Expansion Project* attached as separate document.

Appendix B: Reported Items (No Follow-up Action Planned)

HVAC

Consider replacing constant speed drives with variable speed drives (VFD) on cooling tower, pumps and air-handling unit fans when these units break or need replacement. Variable speed drives enable motors, fans and pumps to be run at slower speeds when demand is lower, saving energy and reducing wear on parts. Contact the Energy Conservation Program for assistance selecting the appropriate products.

Envelope

There were envelope penetrations found in roof (i.e. daylight was visible from inside) that leads energy loss. Sealing these penetrations with caulk, foam board, expanding foam or with other materials can reduce conditioned air loss.

Additionally, during the HVAC retrofit that took place in 1999-2000, there may have been unintended penetration of a firewall located between the hallway and rooms on the third floor of the building.

Water

No additional information is available for these reported items.

Appendix C: Additional Resources

Lighting

Please see separate attachments, *City of Atlanta Lighting Retrofit Guidelines*, for information on how to conduct a building lighting upgrade.

HVAC

Please see the separate attachment, *General Services, Building Controls Expansion Project*, for information on how to improve HVAC system control.

Operations & Maintenance

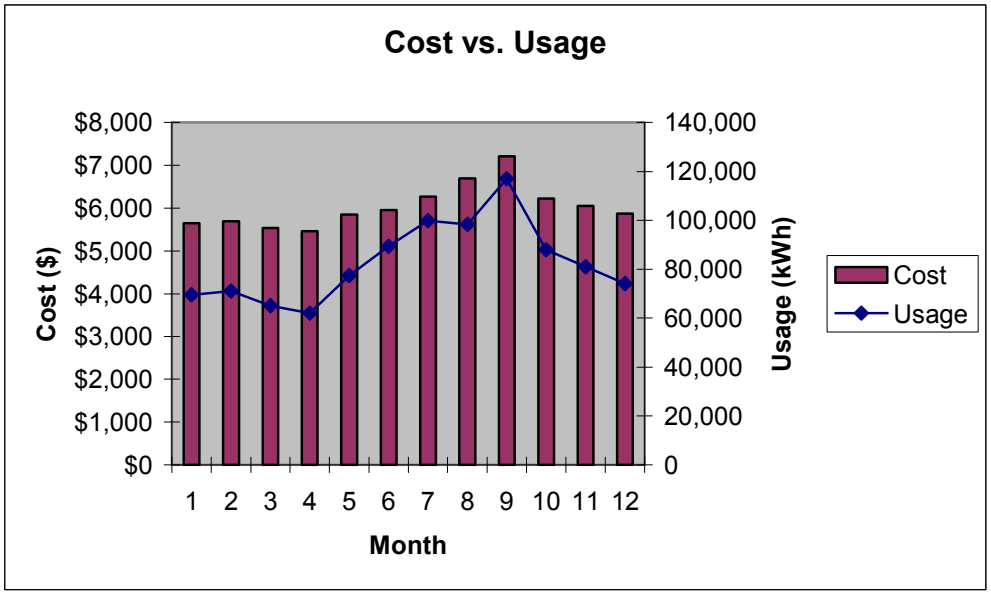
Please see the separate attachment, *Equipment Replacement Guidelines*, for equipment upgrades options when replacing equipment that has reached the end of its service life.

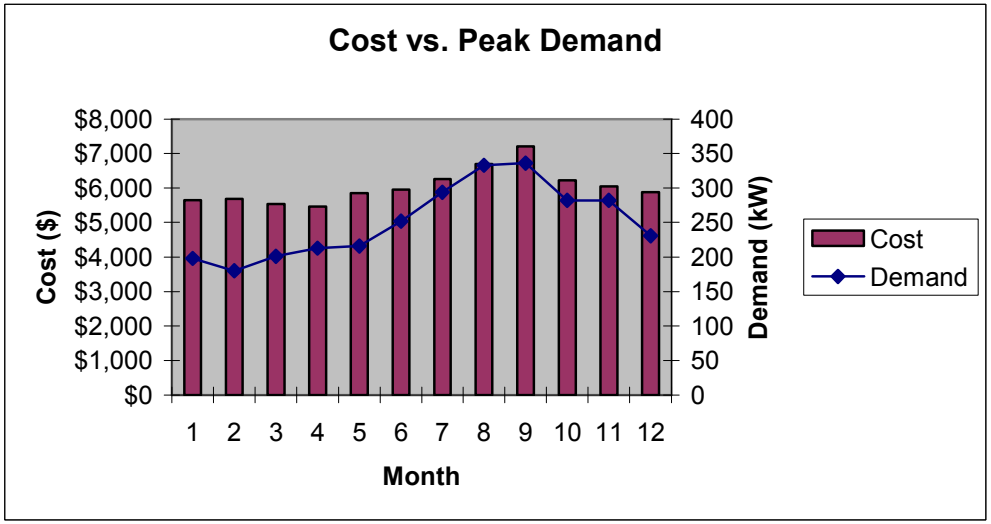
Appendix D: Twelve Month Utility Data

The Table on the following page shows the electricity use, cost and peak demand for the year 2003. The top graph, labeled "Cost vs. Usage" shows the relationship between electricity consumption and cost for the year 2003. The bottom graph, labeled "Cost vs. Demand" shows the relationship between cost and peak demand for the year 2003.

Natural gas cost and usage information has also been provided.

Month	kWh	Peak kW	Cost
Jan-03	69,600	198	$5,651
Feb-03	71,100	180	$5,690
Mar-03	65,100	201	$5,535
Apr-03	62,100	213	$5,458
May-03	77,400	216	$5,853
Jun-03	89,400	252	$5,958
Jul-03	99,900	294	$6,265
Aug-03	98,400	333	$6,696
Sep-03	117,000	336	$7,212
Oct-03	87,900	282	$6,224
Nov-03	81,000	282	$6,048
Dec-03	74,100	231	$5,872
Total	**993,000**	**N/A**	**$72,462**





Natural Gas Data

Month	CCF	Cost
Jan-02	2,657	$1,732
Feb-02	7,461	$4,865
Mar-02	6,822	$4,448
Apr-02	2,832	$1,847
May-02	410	$267
Jun-02	546	$356
Jul-02	137	$89
Aug-02	113	$74
Sep-02	161	$105
Oct-02	1,290	$841
Nov-02	1,357	$885
Dec-02	6,911	$4,506
Total	**30,697**	**$20,016**